REMARKS

First, Applicant notes that in the "Notice of References Cited" included with the Office Action of March 8, 2005, the first patent listed is U.S. Patent No. 5,282,**934** to Cox. This appears to be a typographical error, as U.S. Patent No. 5,282,**964** to Young et al. is referred to in the Office Action, but does not appear on the Notices of References Cited. Furthermore, the Cox patent is directed to an electroplating method that is not related to the subject matter of the present application. Applicant requests that the Notice of References Cited be corrected to remove the reference to the Cox patent and to include U.S. Patent No. 5,282,964 to Young et al.

Claims 1-43 remain pending in this application for consideration. In the Office Action of March 8, 2005, the examiner indicated that claims 10, 15, 17, and 31 are allowable if rewritten in independent form. By the amendments submitted herewith, claims 1, 24, 27, 32, 35, 38, and 41 have been amended to clarify that the claimed invention of the present application contemplates a filtration membrane within the filtration cartridge that is not further contained within a support column. Support for the amendments is found in the original specification, drawings, and claims, thus Applicant believes that no new matter is added by the amendments. Also, submitted herewith is a Petition for Extension of Time in which to file a response to the Office Action, along with the requisite fee.

Rejections Under 35 U.S.C. § 102(b)

In the Office Action of March 8, 2005, the examiner rejected claims 1-9, 11-14, and 16 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,917,798 to *Liou* et al. ("*Liou*"). Independent claim 1 (as amended) of the present application, and thus dependent

claims 2-23, requires that the "said at least one membrane bundle is not contained within said support column". As shown in the embodiment in FIGS. 1-9 of the present application, the present application is directed to a filtration cartridge in which a maximum density of filtration material is achieved by packing the entire cartridge area (other than the permeate tube) with filtration membrane. (See also paragraph 0047 of present application).

Liou, however, does not disclose a filtration cartridge in which filtration material may be placed outside of the reinforcing elements. As described in *Liou*, the hollow fiber bundles are enclosed within a reinforcing element (*see*, e.g., *Liou*, column 1, lines 47-53). *Liou* further states that the fluid "can flow freely in the spaced (sic) between the sleeves", and that "empty spaces are left" to facilitate fluid flow (*Liou*, column 3, lines 25-41). *Liou* clearly does not anticipate filtration membranes located in the cartridge outside of the support sleeves as required in all of the claims of the present application.

Since *Liou* does not disclose any filtration membranes not contained within support columns as required in all of the claims of the present application, the examiner's rejection of claims 1-9, 11-14, and 16 should be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 1, 27-30, 35-37, and 41-43

The examiner rejected claims 1, 27-30, 35-37, and 41-43 under 35 U.S.C. § 103(a) as being unpatentable over *Liou* in view of U.S. Patent No. 5,282,964, to *Young* et al. ("*Young*").

As discussed above with respect to the §102 rejections, *Liou* is directed to a filtration cartridge in which the filtration membranes are entirely contained within support

sleeves. Similarly, *Young* discloses a filtration cartridge in which, when support columns are present, the filtration membranes are contained entirely within the support columns. As seen in FIG. 1 of *Young*, bundles of hollow fibers 11 are assembled within seven cylindrical tubes 10 into a single module 12 (*see* also column 10, lines 26-40 of *Young*). As shown in FIG. 2, cylindrical tubes 20 containing bundles of hollow fibers are attached between opposite tube sheets 23. Figure 3 of *Young* discloses a conventional filtration cartridge without support rods. However, Young does not teach, suggest or disclose a filtration cartridge having support rods where filtration material is placed outside of those support rods.

Independent claims 1, 27, 35, and 41 (as amended) of the present application all require, among other things, placement of filtration membrane within the filtration cartridge that is not contained within a support column. In contrast, *Liou* states that the fluid "can flow freely in the spaced (sic) between the sleeves", and that "empty spaces are left" to facilitate fluid flow (*Liou*, column 3, lines 25-41). And *Young* states that "[b]ecause the resistance to flow is much smaller in the open region between porous and impermeable sleeves than in the area packed with fibers, the permeating fluid will flow radially outward from the fiber bundles into the open region" (*Young*, column 14, lines 9-13).

As stated in MPEP § 2143.01, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. Neither *Liou* nor *Young*, nor their hypothetical combination, teach, suggest, or disclose a filtration cartridge as claimed in the present application, where filtration membranes are present outside of the support columns. Furthermore, even if the references were combined, their combination would not yield the invention as claimed in the

present application. Thus, the examiner's rejection of claims 1, 27-30, 35-37, and 41-43 is unsupported by the art and should be withdrawn.

In addition, as disclosed, *Liou* and *Young* actually teach away from the present invention. Both *Liou* and *Young* tout the advantages (easier flow of fluid into free areas) of not having filtration material outside of the support columns. Thus, each teach away from the invention claimed in the present application where filtration material is allowed outside of the support columns. As stated in MPEP § 2145, it is improper to combine references where the references teach away from their combination. For this additional reason the examiner's rejection of claims 1, 27-30, 35-37, and 41-43 is improper, and should be withdrawn.

Claims 18-23, 24, 28, 32-34, and 38-40

The examiner also rejected claims 18-23, 24, 28, 32-34, and 38-40 under 35 U.S.C. § 103(a) as being unpatentable over *Liou* in view of *Young*, in further view of U.S. Patent No. 4,961,760 to *Caskey* et al. ("Caskey"). The examiner cites Caskey as disclosing a permeate tube through the center of the cartridge that is not disclosed in either *Young* or *Liou,* and that it would have been obvious to combine the teachings of *Young* and *Liou* with the permeate tube disclosed in *Caskey* to arrive at the claimed invention.

First, independent claims 24, 32, and 38 (and dependent claims 18-23, 28, 33-34, and 39-40) are allowable for the reasons discussed above with respect to claims 1, 27-30, 35-37, and 41-43.

Second, as stated in MPEP § 2143.01, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. There is absolutely no teaching, suggestion, or

disclosure in *Young*, *Liou*, or *Caskey* to suggest combining the permeate tube of Caskey with the cartridges disclosed in *Young* and *Liou*. Neither *Young* nor *Liou* discuss permeate tubes passing through the filtration cartridge. *Caskey* does not suggest the use of a permeate tube in applications where, as in *Young* and *Liou*, filtration material is contained entirely within support sleeves within the cartridge.

The examiner appears to be engaging in classic hindsight reconstruction. Having now seen Applicant's invention having a permeate tube through the center of the filtration cartridge, the examiner has chosen several references which disclose these individual features and claims that it would have been obvious to combine them to arrive at Applicant's invention. However, none of the references themselves suggest such a combination. In fact, *Young* and *Liou* disclose cartridges in which the center axis of the cartridge is occupied by a support sleeve containing filtration material. Eliminating the center filtration member to replace it with a permeate tube would remove one-seventh of the cartridge's filtration capability – hardly a tradeoff one skilled in the art would make. Applicant's invention, on the other hand, by allowing filtration material outside of the support sleeves, can achieve high filtration capability and include a central axis permeate tube. For this additional reason, claims 18-23, 24, 28, 32-34, and 38-40 of the present application are allowable, and the examiner's rejection should be withdrawn.

In view of the foregoing remarks, it is respectfully submitted that all claims of the application are now in condition for allowance and eventual issuance. Such action is respectfully requested. Should the Examiner have any further questions or comments which need be addressed in order to obtain allowance, he is invited to contact the undersigned attorney at the number listed below.

Acknowledgement of receipt is respectfully requested.

Respectfully submitted,

By: _____

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